This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (currently amended): A superconducting magnet electrical circuit comprising:

(a) a superconducting coil assemblage including a plurality of spatially separated and geometrically symmetric main magnet coil portions connected in series to form at least one main coil series circuit and a plurality of spatially separated and geometrically symmetric secondary magnet coil portions connected in series to form at least one secondary coil series circuit so that said main coil or said secondary coil circuit will have an exact same current in the coils during a quench, keeping interactive forces among the coils symmetrically balanced;

(b) at least one temperature limiting circuit connected with the superconducting coil assemblage selected from the group consisting a quench heater circuit or a quench resistor circuit; and

(c) a superconductive switch coupled with the superconducting coil assemblage.

Claim 2 (original): A superconducting magnet electrical circuit according to claim 1 wherein said coil portions are essentially completely in contact with a fluid cryogen.

Claim 3 (currently amended): The superconducting magnet electrical circuit according to claim 1 wherein the superconducting coil assemblage has at least two geometrically symmetric main magnet coil portions connected directly in series to form the main coil series circuit so the current in the coils within one series circuit is forced to be the same under normal and quench conditions and the interactive force with the other coils remains balanced during a quench.

Claim 4 (currently amended): The superconducting magnet electrical circuit according to claim 1 wherein the superconducting coil assemblage has at least two geometrically symmetric secondary magnet coil portions connected directly in series to form the secondary coil series circuit so the current in the coils within one series circuit is forced to be the same under normal and quench conditions and the interactive force with the other coils remains balanced during a quench.

Claim 5 (original): The superconducting magnet electrical circuit according to claim 1 wherein the secondary magnet coil

portions carry current in an opposite direction to the main magnet coil portions.

Claim 6 (original): The superconducting magnet electrical circuit according to claim 1 wherein the secondary magnet coil portions form a shielding coil positioned to prevent stray magnetic fields from escaping the magnet assembly.

Claim 7 (currently amended): A superconducting magnet electrical circuit comprising:

(a) a superconducting coil assemblage including a plurality of spatially separated and geometrically symmetric main magnet coil portions connected in series to form at least one main coil series circuit and a plurality of spatially separated and geometrically symmetric secondary magnet coil portions connected in series to form at least one secondary coil series circuit so that said main coil or said secondary coil circuit will have an exact same current in the coils during a quench, keeping interactive forces among the coils symmetrically balanced;

(b) at least one quench heater circuit with a plurality of quench heaters connected in parallel with the superconducting coil assemblage; and

(c) a superconductive switch coupled with the superconducting coil assemblage.

Claim 8 (original): The superconducting magnet electrical circuit according to claim 7 wherein at least one quench heater is positioned in thermal contact with the main magnet coil portions and at least one quench heater is positioned in thermal contact with the secondary magnet coil portions.

Claim 9 (original): The superconducting magnet electrical circuit according to claim 7 wherein the number of said heaters connected in parallel with each of said separated main magnet coil portions is at least equal to the number of said main magnet coil portions being protected.

Claim 10 (currently amended): The superconducting magnet electrical circuit according to claim 7 comprising at least two quench heater circuits <u>with each circuit having a different current decaying profile during a quench</u>.

Claim 11 (original): The superconducting magnet electrical circuit according to claim 10 wherein each quench heater circuit comprises at least two quench heaters.

Claim 12 (currently amended): A superconducting magnet electrical circuit comprising:

(a) a superconducting coil assemblage including a plurality of spatially separated and geometrically symmetric main magnet coil portions connected in series to form at least one main coil series circuit and a plurality of spatially separated and geometrically symmetric secondary magnet coil portions connected in series to form at least one secondary coil series circuit so that said main coil or said secondary coil circuit will have an exact same current in the coils during a quench, keeping interactive forces among the coils symmetrically balanced;

(b) at least one quench resistor circuit connected in parallel with the superconducting coil assemblage, said quench resistor circuit having a plurality of quench resistors connected in series or in parallel with each other; and

(c) a superconductive switch coupled with the superconducting coil assemblage.

Claim 13 (currently amended): A superconducting magnet electrical circuit comprising:

(a) a superconducting coil assemblage including a plurality of spatially separated and geometrically symmetric main magnet coil portions connected in series to form at least one main coil series circuit and a plurality of spatially separated and geometrically symmetric secondary magnet coil portions connected in series to form at least one secondary series circuit so that said main coil or said secondary coil circuit will have an exact same current in the coils during a quench, keeping interactive forces among the coils symmetrically balanced;

(b) at least one quench heater circuit with a plurality of generally identical quench heaters connected in parallel with the superconducting coil assemblage;

(c) at least one quench resistor circuit connected in parallel with the superconducting coil assemblage, said quench resistor circuit having a plurality of generally identical quench resistors connected in series or in parallel with each other; and

(d) a superconductive switch coupled with the superconducting coil assemblage.

Claim 14 (currently amended): A superconducting magnet electrical circuit comprising:

(a) a superconducting coil assemblage including at least two spatially separated and geometrically symmetric main magnet coils connected in series to form at least one main coil series circuit and at least two spatially separated and geometrically symmetric secondary magnet coils connected in series to form at least one secondary coil series circuit, said coils being essentially completely in contact with a fluid cryogen, so that said main coil or said secondary coil circuit will have an exact same current in the coils during a quench, keeping interactive forces among the coils symmetrically balanced;

(b) at least one temperature limiting circuit connected in parallel with the superconducting coil assemblage, said temperature limiting circuit selected from a first group consisting of a quench heater circuit comprising a plurality of quench heaters connected in parallel, and a quench resistor circuit comprising a plurality of quench resistors connected in parallel or in series; and

(c) a superconductive switch coupled with the superconducting coil assemblage.

Claim 15 (currently amended): A superconducting magnet electrical circuit comprising:

(a) a superconducting coil assemblage including at least two spatially separated and geometrically symmetric main magnet coils connected in series to form at least one main coil series circuit and at least two spatially separated and geometrically symmetric secondary magnet coils connected in series to from at least one secondary coil series circuit, said coils being essentially completely in contact with a fluid cryogen, so that said main coil or said secondary coil circuit will have an exact same current in the coils during a quench, keeping interactive forces among the coils symmetrically balanced;

(b) at least one quench heater circuit with a plurality of quench heaters connected in parallel with the superconducting coil assemblage wherein at least one quench heater is positioned in thermal contact with the main coil portion and at least one quench heater is positioned in thermal contact with the secondary magnet coil portion; and

(c) a superconductive switch coupled with the superconducting assemblage.

Claim 16 (currently amended): A superconductive magnet electrical circuit comprising:

(a) a superconducting coil assemblage including at least two spatially separated and geometrically symmetric main magnet coils connected in series to form at least one main magnet coil series circuit and at least two spatially separated and geometrically symmetric secondary magnet coils connected in series to form at least one secondary coil series circuit, said coils being essentially completely in contact with a fluid cryogen, so that said main coil or said secondary coil circuit will have an exact same current in the coils during a quench, keeping interactive forces among the coils symmetrically balanced;

(b) at least one quench heater circuit with a plurality of generally identical quench heaters connected in parallel with the superconducting coil assemblage wherein at least one quench heater is positioned in thermal contact with the main magnet coils; and

(c) at least one quench resistor circuit connected in parallel with the superconducting coil assemblage, said quench resistor circuit having a plurality of generally identical quench resistors connected in series or in parallel with each other; and

(d) a superconductive switch coupled with the superconducting coil assemblage.